

# ***Transportation and the Delaware Climate Change Action Plan***

**Fifth Annual State and Local  
Climate Change Partners Conference**

**Annapolis, 20-22 November 2002**



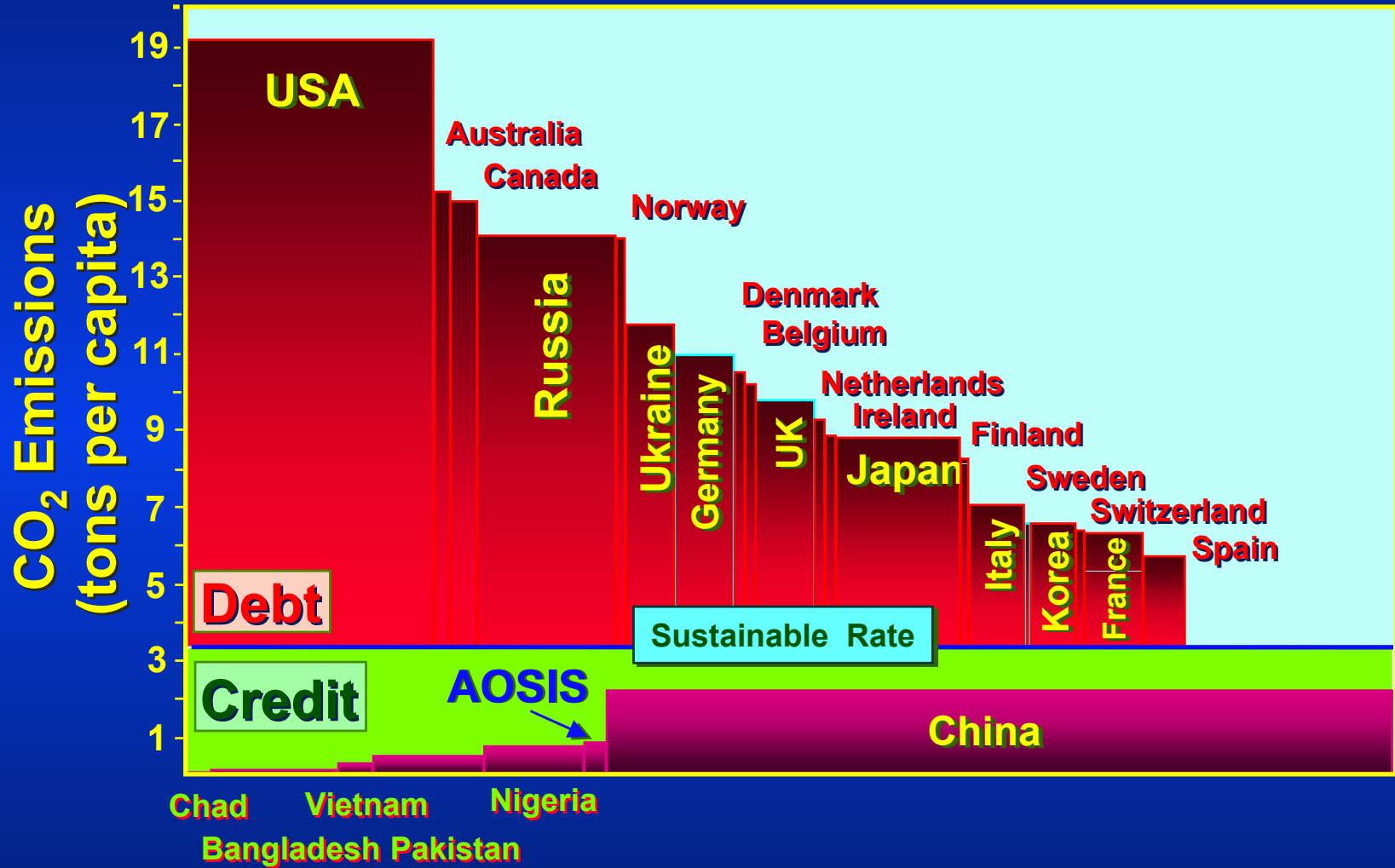
**Center for Energy and Environmental Policy**

# IPCC Estimates of Reductions in Anthropogenic Emissions Needed to Stabilize Atmospheric Concentrations at Current Levels

Greenhouse Gases	Reduction Required
Carbon Dioxide (CO <sub>2</sub> )	> 60%
Methane (CH <sub>4</sub> )	8 - 20%
Nitrous Oxide (N <sub>2</sub> O)	70 - 80%
CFC-11	70 - 75%
CFC-12	75 - 85%
HCFC-22	40 - 50%

Source: IPCC. 1996. *The IPCC Second Assessment Synthesis of Scientific- Technical Information Relevant to Interpreting Article 2 of the UN Framework Convention on Climate Change*. New York, NY: United Nations Environmental Program; Geneva, Switzerland: World Meteorological Organization.

# CO<sub>2</sub> Emissions per Capita



# Why Plan From the “Bottom Up”?

- Climate change mitigation requires **action on all levels**
- Local input is needed to reflect the interests of those **most directly affected**
- Enduring community support can only be obtained by **involving the community itself**
- Many local planning functions will play a **critical role** in reducing U.S. GHG emissions



# Delaware Climate Change Consortium

- 36-member group representing a wide cross-section of the State
- Consensus-based decision-making
- Tasks included reviewing and adopting GHG inventory, mitigation measures, policy options and developing education and outreach program



# Delaware Climate Change Consortium Members

- |   |   |
|---|---|
|  Community Groups |  Federal Government           |
|  Labor            |  State Government             |
|  Industry         |  Local & Regional Governments |
|  Utilities        |   |
|  Research Groups |  State Legislators           |



# Aggregate Emissions Target for Delaware Climate Change Action Plan (DECCAP)

Emissions Target\* : 15.11 MT CO<sub>2</sub>  
2010 Forecast : 19.66 MT CO<sub>2</sub>  
2010 Reduction : 23%

\* U.S. Kyoto target is a 7% reduction from 1990 emission levels. Delaware aggregate CO<sub>2</sub> emissions in 1990 were 16.25 mt (metric).



# **DE Climate Change Action Plan Scenario Development Method**

**Create BAU Forecast  
Using Delaware Econometric Model**



**Review Energy Efficiency Potential  
by Sector**



**Construct Energy Efficiency Databases  
Based on Detailed Technology Assessments**



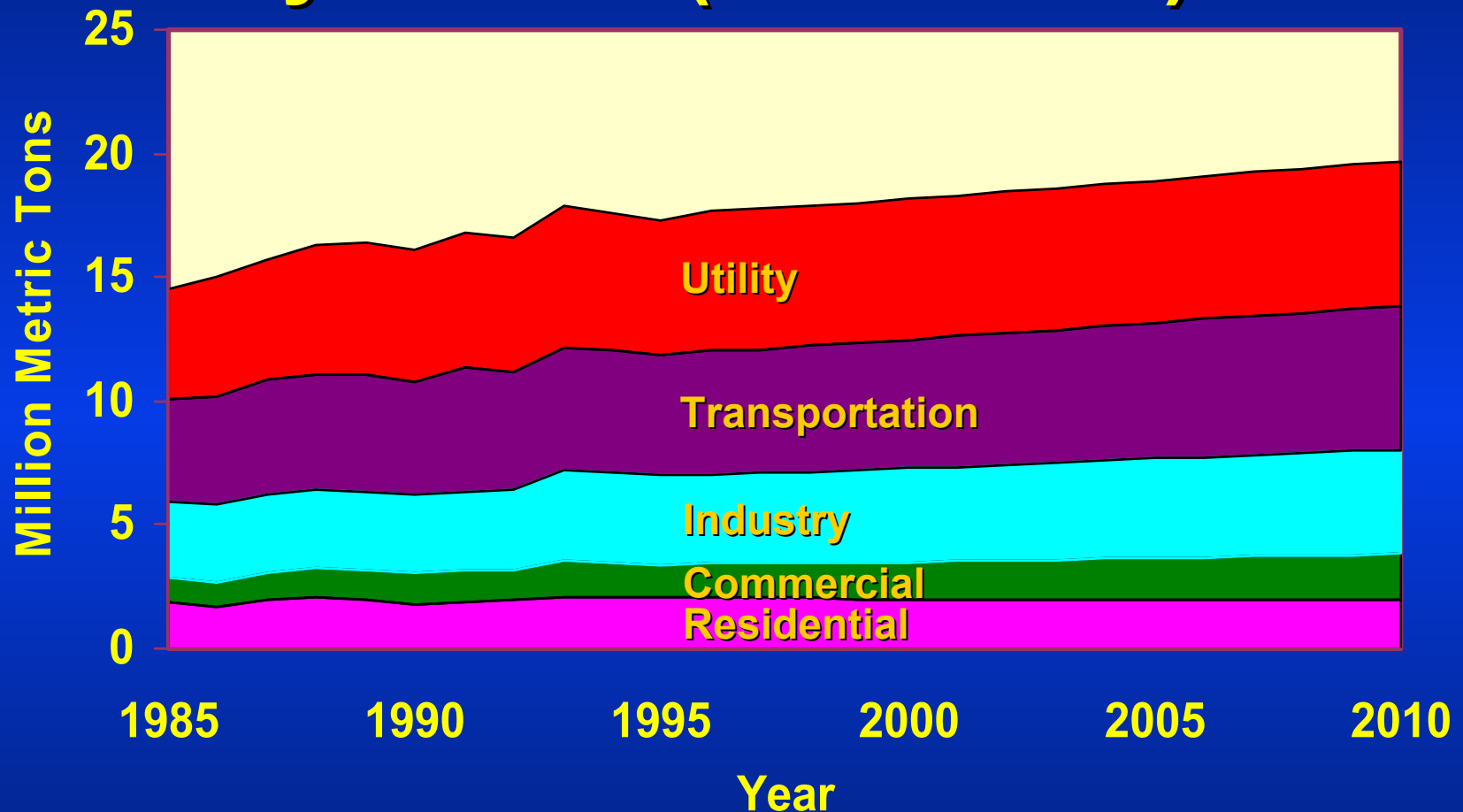
**Develop Alternative  
Scenario Forecasts**



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# Delaware CO<sub>2</sub> Emissions by Sector (1985-2010)\*



\*"Business-as-usual" (BAU) forecast using equations based on the Delaware Econometric Model.



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# Sectoral Shares of Energy and CO<sub>2</sub> Under the Delaware BAU Forecast for 2010

<u>Sectors</u>	<u>Energy</u>	<u>CO<sub>2</sub></u>
Industrial	31.6 %	21.5 %
Residential	10.0 %	9.9 %
Commercial	8.7 %	9.5 %
Transportation	24.2 %	29.6 %
Utility (losses only)	25.5 %	29.6 %



# DECCAP

## CO<sub>2</sub> Reduction Scenarios

- Full Implementation
- Major Commitment
- Modest Commitment



# **DECCAP**

## **CO<sub>2</sub> Reduction Measures for the Transportation Sector**

-  **Fuel Efficiency Improvements**
-  **Fuel Substitution**
-  **Transportation Control Measures**





# Data Sources: Transportation Sector

- **USDOT / USDOE, *Transportation Energy Data Book***
- **STAPPA / ALAPCO, *Reducing Greenhouse Gas Emissions: A Menu of Options (1998)***
- **Interlaboratory Working Group (IWG), *Scenarios of U.S. Carbon Reductions: Potential Impacts of Energy-Efficient and Low-Carbon Technologies by 2010 (1997)***
- **APOGEE Research, *Costs and Effectiveness of Transportation Control Measures***
- **Wisconsin Department of Natural Resource, *Wisconsin Greenhouse Gas Emission Reduction Cost Study***
- **DELDOT, *Statewide Long-Range Transportation Plan***



# **Cost-Effectiveness Criteria for Selection of CO<sub>2</sub> Reduction Scenarios**

-  **Payback Period < 5 years**
-  **Cost per ton of CO<sub>2</sub> Avoided < \$75**



# CO2 Reduction Measures: Transportation Sector

## ❖ Fuel Efficiency Improvements

- ❖ Modest – 2 mpg for Passenger Cars and Light Duty Trucks
- ❖ Major – 5.9 mpg for Passenger Cars, 3.4 mpg for Light Duty Trucks
- ❖ Full Implementation – 7.7 mpg for Passenger Cars, 6.6 mpg for Light Duty Trucks

## ❖ Alternative Fuel Vehicles (AFVs)

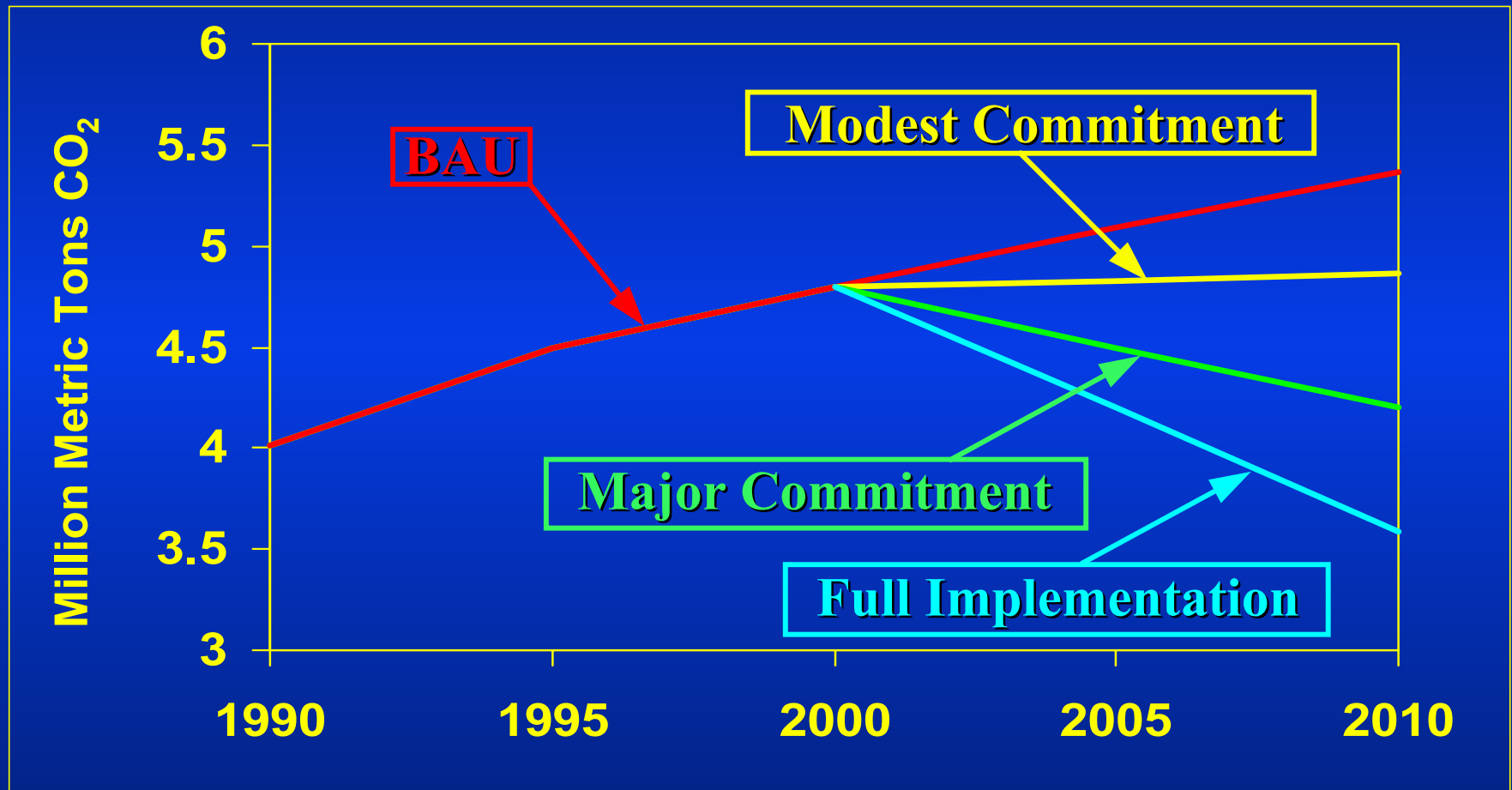
- ❖ Modest – 1% Compressed Natural Gas (CNG) Fleet Penetration
- ❖ Major – 2% CNG Fleet Penetration
- ❖ Full Implementation – 3.5% CNG & 2.5% Electric Vehicle (EV) Fleet Penetration

## ❖ Transportation Control Measures (TCMs)

- ❖ Modest – 3% Reduction in Vehicle Miles Traveled (VMTs)
- ❖ Major – 11% Reduction in VMTs
- ❖ Full Implementation – 20% Reduction in VMTs



# Implementation Scenarios: Transportation Sector





# Percent Reduction in CO<sub>2</sub> Emissions by Energy End-Use Sector Based on Forecast Emissions for 2010

DECCAP Target Reduction for Delaware in 2010 = 23%

	Modest Commitment	Major Commitment	Full Implementation
Industry	9%	18%	27%
Residential	10%	18%	28%
Commercial	9%	18%	27%
Transportation	10%	24%	36%
Utilities	17%	24%	40%
TOTAL	12%	23%	32%



# Keys to DCCC's Success

- Adopt **majority** citizen group participation
- **Balance membership** in the DCCC to include constituencies beyond the technical and scientific fields
- Require **consensus** for measure selection and plan adoption
- Utilize an **NGO coordinator**



# Citizen Impact

- **Measure Selection:** Members vetoed gas tax proposal
- **Plan Scope:** Members required inclusion of growth management strategies and education and outreach even though quantitative measures of their impacts were not available
- **Planning Process:** Members required transparency of Action Planning



# Conclusions

- Citizens are concerned about climate change and are prepared to plan actions
- Effective planning requires capacity-building for ongoing and active community involvement
- Practical, cost-effective strategies can be identified through consensus-based stakeholder planning
- Delaware Climate Change Action Plan taken up in State Energy Planning process and 'Livable Delaware' project



# ***Delaware Climate Change Action Plan***

***Available online:***  
***[www.udel.edu/ceep](http://www.udel.edu/ceep)***



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